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Floristic Quality Assessment of the Illinois Department of Transportation Project Area FAP 29 & FAP 860 (US 34/IL 331), Kendall County

Report of the 1994 Survey

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INTRODUCTION

A request was received on 16 August 1993 for a botanical survey of the proposed FAP 29 & FAP 860 (US Route 34/IL Route 31) Illinois Department of Transportation (IDOT) project area. The specified goal of this survey was to conduct an inventory of threatened and endangered species within the project corridor. In addition, the natural quality of the vegetation was assessed. Prior work on this project area includes a fall botanical inventory (Taft 1994) and a wetland survey (Nugteren et al. 1993). The botanical survey, conducted on 24 September 1993, yielded the discovery of two separate colonies of an Illinois-endangered plant species, Veronica americana (American brooklime), and two noteworthy wetlands, a forest opening seep complex and a graminoid fen/seep (Taft 1994). An additional early season botanical survey was recommended in these areas in order to more comprehensively inventory the flora. Such a survey was requested by Dr. George Rose of the IDOT (telephone conversation of April 1994). The 1994 survey included the forested slope west of the original study area, extending approximately to directly behind existing residences at the top of the slope, and east in the fen-like community to about 100 m east of the former east boundary of the study area (Figure 1).

METHODS

A search was conducted for rare, threatened, and endangered plant species throughout the expanded study area and the natural quality of the vegetation was further evaluated using Illinois Natural Area Inventory (INAI) criteria (White 1978). A method of floristic quality assessment (Wilhelm et al., in prep.) was also applied using the combined 1993 and 1994 inventory data. Field work was conducted on 24 September 1993 and 18-19 May 1994. Botanical nomenclature follows Mohlenbrock (1986).

RESULTS AND DISCUSSION

Threatened and Endangered Species

No additional threatened or endangered plant species were discovered in the study area during this field survey (but see discussion of Sanicula trifoliata below). The colonies of Veronica americana are still present and in similar vigor and size compared with September 1993 (Taft 1994). The demographic, habitat, and associate data are again summarized in Appendix 1. A flowering stem of an individual (Taft #1131 ILLS) was taken from the largest colony (#1) to complement the voucher taken in 1993 (Taft #1129 ILLS) which was a fruiting specimen.

Noteworthy Natural Communities

The natural communities previously described as noteworthy

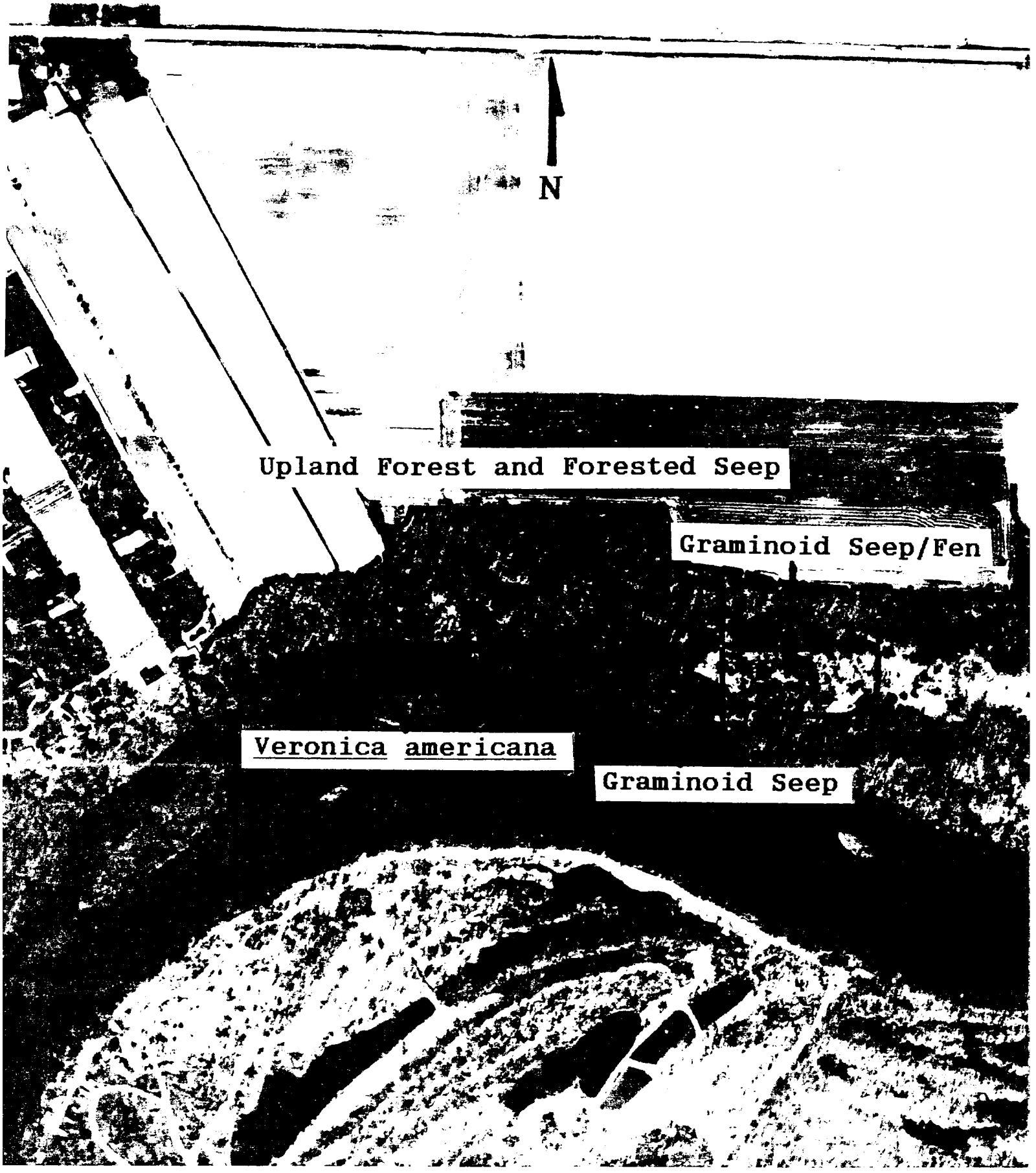

Figure 1. Location of Veronica americana, an Endangered Species in Illinois, in the Illinois Department of Transportation project area FAP 29 & FAP 860 (US 34/IL 31) in Kendall County. See text and Appendix 1 for habitat and demographic data. Also shown is the Forested Seep and Upland Forest complex and the graminoid seep and seep/fen communities described as regionally significant natural areas (see report text). Original survey boundaries are shown in solid line, additional areas surveyed in 1994 are shown with a dashed line.

(Taft 1994) were inventoried further during the 1994 field survey. Additional species observed are added in the following descriptions forming combined lists from the 1993 and 1994 surveys. Floristic quality assessment of each area is included in the appendices; the floristic quality data are summarized following each description.

Mature Mesic Upland Forest and Forested Seep Complex (Grade C+).

The structure and composition of this area (Figure 1) is typical of much of the forested slopes along the Fox River. The original, presettlement vegetation appears to have been a bur oak-dominated woodland or savanna with numerous seeps. Sugar maple (Acer saccharum) dominates the smaller size classes while bur oak (Quercus macrocarpa) is present in only the largest size classes (observation). On the upper terrace are level to gently sloping seepage areas with large colonies of skunk cabbage (Symplocarpus foetidus). There is an infestation of the adventive biennial weed Alliaria petiolata in non-saturated areas. The dense shade produced by the sugar maple and competition from A. petiolata appear to be responsible for somewhat low diversity throughout portions of the matrix area. In contrast, two open seeps (following descriptions) support a rich assortment of seep species. The composition and structure of the woodland slopes and terraces, including species of a spring-fed artificial pond and forested seeps, are described in more detail below.

canopy dominants - Quercus macrocarpa

occasional canopy - Quercus prinoides var. acuminata

common subcanopy - Acer saccharum

occasional subcanopy - Tilia americana, Fraxinus nigra, Ulmus rubra, Acer negundo, Juglans nigra, Fraxinus americana, Juniperus virginiana

shrubs/vines - Sambucus canadensis, Asimina triloba, Cornus alternifolia, Ribes americana, R. missouriense, Viburnum prunifolium, Viburnum opulus*, Lonicera maackii*, Berberis thunbergii*, Prunus virginiana, Ptelea trifoliata, Lonicera prolifera, Parthenocissus quinquefolius, Toxicodendron radicans

herbaceous species (with relative abundance values):

1	Actaea alba	2	Allium tricoccum
1	Actaea pachypoda	2	Anemone quinquefolia
2	Agrimonia gryposepala	2	Aquilegia canadensis
4-5	Alliaria petiolata*	2	Arabis laevigata

2	Asarum canadense	3	Impatiens capensis
1	Botrychium virginianum	2	Laportea virginica
2	Bromus purgans	3	Leersia virginica
2	Caltha palustris	1	Lilium michiganense
2	Campanula americana	1	Nasturtium officinale*
3-4	Cardamine bulbosa	3	Pilea fontana
2	Carex jamesii	2	Polygonatum canaliculatum
2	Carex oligocarpa	3	Ranunculus recurvatus
2	Carex pensylvanica	2	Ranunculus septentrionalis
2	Carex sparganioides	2	Rudbeckia laciniata
1-2	Carex stipata	2	Sanguinaria canadensis
1	Cicuta glomerata	2	Sanicula trifoliata
2	Cinna arundinacea	1	Scrophularia marilandica
2	Circaea lutetiana	2	Smilacina racemosa
2	Clematis virginiana	2	Smilacina stellata
2	Dentaria laciniata	2	Solidago flexicaulis
1	Echinocystis lobata	1	Solidago gigantea
3-4	Equisetum arvense	4	Symplocarpus foetidus
2	Equisetum laevigatum	1	Thalictrum dasycarpum
2	Eupatorium rugosum	2	Thalictrum dioicum
1	Erigeron philadelphicum	2	Thaspium trifoliatum
2	Galium circaezans	2	Trillium recurvatum
2	Geranium maculatum	2	Verbesina alternifolia
2	Geum canadense	1	Veronica americana
3	Glyceria striata	2	Viola sororia
2	Hepatica acutiloba		

1=rare
2=uncommon
3=common
4=abundant
5=very abundant
*=adventive species

Two species, Actaea rubra and Sanicula trifoliata, present in the non-saturated upland matrix are noteworthy occurrences. Actaea rubra (red baneberry) is a northern species present in the upper two tiers of Illinois counties and only found sparingly, usually in relatively undisturbed rich woodlands. Sanicula trifoliata (large-fruited black snakeroot) ranges from Vermont to Michigan and south to North Carolina and Tennessee (Gleason 1952). Sanicula trifoliata is uncommon in Illinois, found in only the northeastern quarter of the state where it is known from mostly mesic upland forest in about eight counties (Mohlenbrock and Ladd 1978). Swink and Wilhelm (1994) report this species as local in their region. Until a photocopy of a specimen from this Kendall County population was sent to the Morton Arboretum, Wilhelm and Swink had not seen this species or a specimen from their Illinois counties. This is the only population of this species I have seen in Illinois. Further, despite extensive collecting throughout his career, Robert Evers, emeritus botanist from the Illinois Natural History Survey (INHS), apparently never collected this species. John Schwegman, who has over 25 years of extensive botanical experience throughout Illinois, has never seen this species in the state (pers. comm. 5 December 1994).

Rick Phillippe, INHS collections manager and an authority on the genus Sanicula (Ph.D. dissertation), has found two populations in Illinois that probably remain extant, one each in Jo Daviess and Vermilion counties. Other counties of reported occurrence include Tazewell and Peoria. These represent collections by Virginius Chase, and are thus old collections and may not be represented by extant populations (Phillippe 1978). This review suggests that this taxon may been quite rare in Illinois and possibly a candidate for listing as a watch, threatened, or endangered species. Both Actaea rubra and Sanicula trifoliata were sparse in the study area, occurring about midway between the north boundary and the graminoid seep that occurs within the small forest opening (Figure 1).

A subtle qualitative difference is found in the species composition of the forest community west of the original survey boundary. This line corresponds to an existing property boundary and is marked on the ground by a barbed-wire fence. This fence separates the less disturbed central study area from a somewhat more degraded area to the west. Though possibly exposed to a greater grazing disturbance, the forest to the west of this property boundary retains a diverse spring flora and numerous seeps. However, none of the seeps are as diverse as the open graminoid seep and seep/fen communities described below.

A floristic quality index (FQI) was calculated for the forested matrix area, including forested seeps and the artificial pond, and the results are described in Appendix 2. To summarize, the native index, determined from the combined fall and spring inventories, is 35.7 and the native mean-coefficient of conservatism is 4.4. Generally, sites with indices greater than 35.0 and/or mean native coefficients greater than 4.5 are strongly correlated with sites that are at least regionally significant natural areas (Wilhelm et al., in prep.).

Graminoid Seep (Grade B)

A small, open, graminoid-seep community with a moderate slope towards the Fox River occurs within the forested seep and upland forest matrix (Figure 1). This area supports one of the two colonies of the state-endangered Veronica americana found in the study area (see account above). This seep remains open (lacking a forest canopy cover) and is dominated by graminoid and forb species while most of the other seeps are within forest cover and lack a graminoid component. The seeps with forest cover tended to be on more level terraces with broad fans of saturated muck while this community was more sloping with well-defined spring runs and lacking an accumulation of muck. Differential silt loading from the cultivated uplands to the north onto the more level forested seep areas compared with the more sloping graminoid seep is a probable explaination for much of the compositional differences. The composition of this seep is listed below with relative abundance values.

2	Amphicarpa bracteata var. comosa	3-4	Impatiens capensis
2	Angelica atropurpurea	3	Leersia virginica
1	Asclepias incarnata	3	Lobelia siphilitica
2	Aster lateriflorus	2-3	Lysimachia nummularia*
2	Aster puniceus	1	Pedicularis canadensis
1	Carex granularis	3	Pilea fontana
2	Carex laevivaginata	2	Ranunculus recurvatus
3	Carex leptalea	3	Ranunculus septentrionalis
2	Carex lurida	1	Ribes americanum
2	Carex stipata	2	Sagittaria latifolia
2	Carex stricta	2	Salix discolor
2	Chelone glabra	2	Salix x subsericea
2	Cicuta maculata	2	Sambucus canadensis
2-3	Equisetum arvense f. ramulosum	2	Scirpus atrovirens
		2	Scirpus sp. (vegetative)
3-4	Eupatorium maculatum	1-2	Solanum dulcamera*
2	Eupatorium perfoliatum	3-4	Solidago patula
2	Glyceria striata	4	Symplocarpus foetidus
1	Helenium autumnale	1	Veronica americana
		1	Viburnum opulus*

1=rare
2=uncommon
3=common
4=abundant
5=very abundant
*=adventive species

Localized within this seep community is a small colony of Salix x subsericea (Taft #1134 ILLS), a willow considered to be a hybrid between S. petiolaris and S. sericea (Mohlenbrock 1986). Coincidentally, Gerould Wilhelm also recently discovered this population during a botanical survey of the Fox River bluffs in Kendall County. He notes that this is the only known station for this taxon in the Chicago region and that neither putative parent is present in the vicinity of this population (Swink and Wilhelm 1994). Wilhelm has suggested that this taxon may represent a species rather than a hybrid (pers. comm.). Gleason (1952) includes S. subsericea at the specific level, while Gleason and Cronquist (1991) indicate that the material referable as S. x subsericea is possibly of hybrid origin. Gleason (1952) notes the range for this taxon as throughout lower Canada with southern extensions into the upper Midwest.

The FQI for this seep community is 29.3 (native index) with a mean coefficient of 5.0 (native mean). The relatively high native mean is the most meaningful value in this instance since this inventory unit was very small; consequently, the total unit vascular plant diversity (N = 37) is less than the much larger matrix area (N = 69). The floristic quality data are described completely in Appendix 3.

Graminoid Seep/Fen (Grade C+ to B)

The soil unit in the area described here as a graminoid seep/fen (Figure 1) is mapped as Houghton muck, not a calcareous soil (Paschke 1978). However, the presence of fairly strict

calcicolus species in this community (eg. Caltha palustris, Cirsium muticum, Pedicularis canadensis, Selaginella apoda, Chelone glabra, Solidago patula) suggests that Lena muck may be the correct soil series in this area. The matrix soil series, Millington silt loam, is a calcareous, mostly mineral, soil (Paschke 1978). With the presence of ubiquitous calcareous seeps along this slope of the Fox River, mineralized by underlying dolomitic gravelly till, it is unlikely that this local, slightly sloping, area is not affected by this calcareous substrate. Results from a recent wetland survey (Nugteren et al. 1993) indicated Lena Muck for the soil type throughout this survey area. The classification of a seep/fen community, instead of seep only, is based on a field perception of springiness in the soil. Such a response is typically not present in mucks but is typical of a substrate high in peat. The separation between muck and peat is based on percent fibrous (incompletely decomposed) organic matter. These organic soil types are difficult to distinguish in the field when the percent fibrous material is near the threshold for both classifications. Should a closer examination determine that the soil in this graminoid community is primarily muck (highly decomposed organic matter), then according to the community classification in White (1978) this area should be described as a graminoid seep.

The composition, with relative abundance values, of the graminoid fen-like community is briefly described below.

1	Angelica atropurpurea	2	Galium tinctorium
3	Aster puniceus	2	Glyceria striata
3	Caltha palustris	2	Iris shrevei
3-4	Cardamine bulbosa	2-3	Leersia oryzoides
1	Carex comosa	2	Lycopus americana
2	Carex hystricina	2	Muhlenbergia mexicana
2	Carex interior	2	Pedicularis canadensis
2	Carex laevivaginata	2	Poa pratensis*
4	Carex leptalea	2	Pycnanthemum virginianum
2	Carex sartwellii	2	Rhamnus frangula*
2	Carex stricta	2	Ribes americana
2	Carex suberecta	2	Salix discolor
2-3	Carex trichocarpa	2	Scirpus tabernaemontanii
2	Chelone glabra	3-4	Selaginella apoda
2	Cirsium muticum	1-2	Silphium perfoliatum
2	Cornus stolonifera	3	Solidago patula
2	Epilobium ciliatum	4	Symplocarpus foetidus
3-4	Equisetum arvense	1	Taraxicum officinale*
1	Eupatorium perfoliatum	2	Typha latifolia
3	Fraxinus nigra	2	Viola obliqua

1=rare
2=uncommon
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*=adventive species

The FQI for this seep/fen community is 34.9 (native index)

with a mean coefficient of 5.7 (native mean). The floristic quality data are described completely in Appendix 4. Both the native index and particularly the native mean are supportive of this community as a regionally significant natural area.

When the three noteworthy natural communities described above are combined into a single species list, the FQI is 43.8 (native index) and the mean native coefficient is 4.7 (Appendix 5). Generally, sites rating with indices of 45 or greater often compare in natural quality with INAI Category I sites. A more expanded inventory of this river bluff community beyond the arbitrary boundaries of the study unit would certainly yield new species and the likelihood that the combined site index would exceed 45. It is useful and informative to evaluate each of these natural communities individually. However, recognition that they are components of a single diverse system also justifies the evaluation of the floristic quality for the entire connected study unit. With proper management geared towards reducing the Alliaria petiolata, the shade from the developing subcanopy of Acer saccharum, and (suspected) siltation from cultivated uplands, this forest and seep complex would probably show qualitative improvement and in time could qualify as a Category I candidate for the INAI. Presently, the study unit is of higher natural quality than other nearby Fox River bluff communities (Taft 1993, Taft 1994). Due to the distinctive geological and botanical features characterized by river bluffs with associated dolomitic outcrops and glacial outwash features, and localized fens and seeps, the Fox River bluffs region was recognized by Swink and Wilhelm (1994) as a distinct section, the Fox River Bluff Section, within the Northeastern Morainal Natural Division (Schwegman et al. 1973).

Currently, the habitats for Veronica americana and the critical buffer areas (ie. the artificial pond and the springs that feed it and the graminoid seep and associated spring runs) qualify as Category II inclusions to the INAI. These may be the only remaining populations of this species in Illinois. If the Endangered Species Protection Board, after review and consideration, adds Sanicula trifoliata to the list of Illinois threatened or endangered species, the INAI boundary would also include the upland forest matrix areas supporting this species. A specific survey to map the population of S. trifoliata would be necessary to identify the total extent and size of the population.

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APPENDIX 1

THREATENED AND ENDANGERED SPECIES SUMMARY FORM

PROJECT AREA - FAP 860 & FAP 29 (US 34/IL 31)

TAXON - Veronica americana (Raf.) Schwein. STATUS - State Endangered

COUNTY - Kendall DATE - 24 September 1993 and 18 May 1994

LOCATION IN THE PROJECT AREA: (See Figure 1)

legal location - T37N, R7E, NW/4, SW/4, NE/4 Section 27

POPULATION DATA:

population size - Colony #1: ~75% cover in 6.5 m^2
Colony #2: 32 stems in 0.5 m^2

reproductive state - Colony #1: ~50% of stems in fruit
Colony #2: all vegetative

photograph - Yes
voucher - Taft #1129 and 1131 ILLS

DESCRIPTION OF THE COMMUNITY:

community classification - (both colonies) margins of spring run
Colony #1: edge of artificial pond
Colony #2: graminoid seep

slope/aspect - <5% slope to south

community dominants - Colony #1: *Bidens* cf. *tripartita*, *Nasturtium officinale*, *Leersia virginica*, *Impatiens capensis*
Colony #2: *Carex leptalea*, *Solidago patula*, *Pilea fontana*, *Symplocarpus foetidus*, *Eupatorium maculatum*, *Leersia virginica*

species' associates - Colony #1: *Nasturtium officinale*, *Bidens* cf. *tripartita*, *Equisetum arvense*, *Leersia virginica*
Colony #2: *Pilea fontana*, *Leersia virginica*, *Cinna arundinacea*, *Impatiens capensis*, *Rudbeckia laciniata*

comments - Both colonies are spreading across saturated mucky sand adjacent to spring runs (see text). Sprawling, branched habit makes determining plant number difficult.

APPENDIX 2

SITE: Forest and Forested Seeps
COUNTY: Kendall
DATE: 24 September 1993, 18 & 19 May 1994
BY: John Taft
FILE: Kendfore

FLORISTIC QUALITY DATA		NATIVE		ADVENTIVE	
65	NATIVE SPECIES	13 Tree	18.8%	0 Tree	0.0%
69	Total Species	6 Shrub	8.7%	3 Shrub	4.3%
4.43	NATIVE MEAN	5 Vine	7.2%	0 Vine	0.0%
4.17	W/Adventives	31 Forb	44.9%	1 Forb	1.4%
35.72	NATIVE INDEX	4 Grass	5.8%	0 Grass	0.0%
34.67	W/Adventives	4 Sedge	5.8%	0 Sedge	0.0%
0.7	NATIVE WETNESS	2 Fern	2.9%	0 Fern	0.0%
0.8	W/Adventives				
AVG:	FACULTATIVE (-)				

ACRONYM	CC	SCIENTIFIC NAME	CW	WETNESS	PHYSIOG	COMMON NAME
ACENEG	1	Acer negundo	-2	FACW-	N TREE	ASH-LEAVED MAPLE
ACESAI	1	Acer saccharinum	-3	FACW	N TREE	RIVER MAPLE
ACTPAC	7	Actaea pachypoda	5	UPL	N FORB	DOLL'S-EYES
ACTRUB	9	Actaea rubra	5	UPL	N FORB	RED BANEBERRY
AGRGRY	2	Agrimonia gryposepala	2	FACU+	N FORB	TALL AGRIMONY
ALLPET	*	ALLIARIA PETIOLATA	0	FAC	A FORB	GARLIC MUSTARD
ANEQUI	8	Anemone quinquefolia	0	FAC	N FORB	WOOD ANEMONE
AQUCAN	6	Aquilegia canadensis	1	FAC-	N FORB	COLUMBINE
ARALAE	4	Arabis laevigata	5	UPL	N FORB	SMOOTH ROCK CRESS
ASACAN	5	Asarum canadense	5	UPL	N FORB	CANADA WILD GINGER
ASITRI	4	Asimina triloba	0	FAC	N TREE	BANANA TREE
BERTHU	*	BERBERIS THUNBERGII	4	FACU-	A SHRUB	JAPANESE BARBERRY
BOTVIR	4	Botrychium virginianum	3	FACU	N FERN	RATTLESNAKE FERN
BROPUR	7	Bromus purgans	-2	FACW-	N GRASS	BROME GRASS
CALTPA	7	Caltha palustris	-5	OBL	N FORB	COWSLIP
CAMAME	3	Campanula americana	0	FAC	N FORB	AMERICAN BELLFLOWER
CARBUL	5	Cardamine bulbosa	-5	OBL	N FORB	BULB BITTERCRESS
CXJAME	4	Carex jamesii	5	UPL	N SEDGE	GRASS SEDGE
CXOLIC	6	Carex oligocarpa	5	UPL	N SEDGE	SEDGE
CXPENP	5	Carex pensylvanica	5	UPL	N SEDGE	PENNSYLVANIA SEDGE
CXSTIP	2	Carex stipata	-5	OBL	N SEDGE	PRICKLY SEDGE
CINARU	5	Cinna arundinacea	-3	FACW	N GRASS	STOUTWOOD REED
CLEVIR	3	Clematis virginiana	0	FAC	N VINE	VIRGIN'S BOWER
CORALT	6	Cornus alternifolia	5	UPL	N TREE	ALTERNATE-LEAVED DOGWOOD
CUSGLO	6	Cuscuta glomerata	0	FAC	N VINE	DODDER
DENLAC	4	Dentaria laciniata	5	UPL	N FORB	PEPPER-ROOT
ECHLOB	4	Echinocystis lobata	-2	FACW-	N VINE	WILD BALSAM-APPLE
EQUARV	0	Equisetum arvense	0	FAC	N FERN	COMMON HORSETAIL
ERIPHI	3	Erigeron philadelphicus	-3	FACW	N FORB	MARSH FLEABANE
FRAAMC	4	Fraxinus americana	3	FACU	N TREE	WHITE ASH
FRANIG	8	Fraxinus nigra	-4	FACW+	N TREE	BLACK ASH
GALCIR	4	Galium circaezans	4	FACU-	N FORB	WILD LICORICE
GLYSTR	4	Glyceria striata	-5	OBL	N GRASS	FOWL MANNA GRASS
IMPCAP	2	Impatiens capensis	-3	FACW	N FORB	JEWELWEED
JUGNIG	4	Juglans nigra	3	FACU	N TREE	BLACK WALNUT
JUNVIR	1	Juniperus virginiana	3	FACU	N TREE	EASTERN RED CEDAR
LAPCAN	2	Laportea canadensis	-3	FACW	N FORB	CANADA WOOD NETTLE
LEEVIR	4	Leersia virginica	-3	FACW	N GRASS	WHITE GRASS
LILMIC	6	Lilium michiganense	-1	FAC+	N FORB	MICHIGAN LILY
LONMAA	*	LONICERA MAACKII	5	UPL	A SHRUB	AMUR HONEYSUCKLE
LONPRO	5	Lonicera prolifera	5	UPL	N SHRUB	GRAPE HONEYSUCKLE
PARQUI	2	Parthenocissus quinquefolia	1	FAC-	N VINE	VIRGINIA CREEPER
PILFON	6	Pilea fontana	-3	FACW	N FORB	CLEARWEED
POLCAN	5	Polymnia canadensis	5	UPL	N FORB	LEAFCUP
PRUVIR	3	Prunus virginiana	1	FAC-	N SHRUB	COMMON CHOKECHERRY
PTETRT	4	Ptelea trifoliata	2	FACU+	N TREE	WAFER ASH
QUEMAC	5	Quercus macrocarpa	1	FAC-	N TREE	BURR OAK
QUEPRA	5	Quercus prinoides acuminata	4	FACU-	N TREE	CHINKAPIN OAK
RANREC	5	Ranunculus recurvatus	-3	FACW	N FORB	HOOKED BUTTERCUP

RIBAME	5	Ribes americanum	-3	FACW	N SHRUB	WILD BLACK CURRENT
RIBMIS	2	Ribes missouriense	5	UPL	N SHRUB	MISSOURI GOOSEBERRY
RUDLAC	3	Rudbeckia laciniata	-4	FACW+	N FORB	CUTLEAF CONEFLOWER
SAMCAN	2	Sambucus canadensis	4	FACU-	N SHRUB	COMMON ELDER
SANTRI	8	Sanicula trifoliata	5	UPL	N FORB	LARGE-FRUITED BLACK SNAKERO
SMIRAC	4	Smilacina racemosa	3	FACU	N FORB	FALSE SOLOMON SEAL
SMISTE	5	Smilacina stellata	1	FAC-	N FORB	STARRY FALSE SOLOMON SEAL
SYMFOE	8	Symplocarpus foetidus	-5	OBL	N FORB	SKUNK CABBAGE
THADAD	5	Thalictrum dasycarpum	-2	FACW-	N FORB	PURPLE MEADOW RUE
THADIO	5	Thalictrum dioicum	2	FACU+	N FORB	EARLY MEADOW RUE
THATRT	6	Thaspium trifoliatum	5	UPL	N FORB	MEADOW PARSNIP
TILAME	5	Tilia americana	3	FACU	N TREE	AMERICAN LINDEN
TOXRAD	1	Toxicodendron radicans	3	FACU	N VINE	POISON IVY
TRIREC	5	Trillium recurvatum	4	FACU-	N FORB	RED TRILLIUM
ULMRUB	3	Ulmus rubra	0	FAC	N TREE	SLIPPERY ELM
VERALT	4	Verbesina alternifolia	-3	FACW	N FORB	WING STEM
VERAME	10	Veronica americana	-5	OBL	N FORB	AMERICAN BROOKLIME
VIBOPU	*	VIBURNUM OPULUS	0	FAC	A SHRUB	EUROPEAN HIGH-BUSH CRANBERR
VIBPRU	4	Viburnum prunifolium	3	FACU	N SHRUB	BLACK HAW
VIOSOR	3	Viola sororia	1	FAC-	N FORB	WOOLLY BLUE VIOLET

APPENDIX 3

SITE: graminoid seep
COUNTY: Kendall
DATE: 24 September 1993, 18 & 19 May 1994
BY: John Taft
FILE: Kendseep

FLORISTIC QUALITY DATA		NATIVE		ADVENTIVE	
34	NATIVE SPECIES	0 Tree	0.0%	0 Tree	0.0%
37	Total Species	4 Shrub	10.8%	1 Shrub	2.7%
5.03	NATIVE MEAN	1 Vine	2.7%	1 Vine	2.7%
4.62	W/Adventives	19 Forb	51.4%	1 Forb	2.7%
29.33	NATIVE INDEX	2 Grass	5.4%	0 Grass	0.0%
28.11	W/Adventives	7 Sedge	18.9%	0 Sedge	0.0%
-3.6	NATIVE WETNESS	1 Fern	2.7%	0 Fern	0.0%
-3.5	W/Adventives				
AVG: FAC, WETLAND (+)					

ACRONYM	CC	SCIENTIFIC NAME	CW	WETNESS	PHYSIOG	COMMON NAME
AMPBRC	4	Amphicarpa bracteata comosa	0	FAC	N VINE	HOG PEANUT
ANGATR	6	Angelica atropurpurea	-5	OBL	N FORB	ANGELICA
ASCINC	4	Asclepias incarnata	-5	OBL	N FORB	SWAMP MILKWEED
ASTLAT	2	Aster lateriflorus	-2	FACW-	N FORB	SIDE-FLOWERED ASTER
ASTPUN	8	Aster puniceus	-5	OBL	N FORB	SWAMP ASTER
CXGRNG	3	Carex granularis	-4	FACW+	N SEDGE	MEADOW SEDGE
CXLAEG	7	Carex laevivaginata	-5	OBL	N SEDGE	SEDGE
CXLEPT	10	Carex leptalea	-5	OBL	N SEDGE	BRISTLE STALKED SEDGE
CXLURI	7	Carex lurida	-5	OBL	N SEDGE	SEDGE
CXSTIP	2	Carex stipata	-5	OBL	N SEDGE	PRICKLY SEDGE
CXSTRI	5	Carex stricta	-5	OBL	N SEDGE	TUSSOCK SEDGE
CHEGLB	7	Chelone glabra	-5	OBL	N FORB	WHITE TURTLEHEAD
CICMAC	4	Cicuta maculata	-5	OBL	N FORB	WATER HEMLOCK
EQUARV	0	Equisetum arvense	0	FAC	N FERN	COMMON HORSETAIL
EUPMAC	5	Eupatorium maculatum	-5	OBL	N FORB	SPOTTED JOE PYE WEED
EUPPER	4	Eupatorium perfoliatum	-4	FACW+	N FORB	COMMON BONESET
GLYSTR	4	Glyceria striata	-5	OBL	N GRASS	FOWL MANNA GRASS
HELAUT	3	Helenium autumnale	-4	FACW+	N FORB	AUTUMN SNEEZEWEED
IMPCAP	2	Impatiens capensis	-3	FACW	N FORB	JEWELWEED
LEEVIR	4	Leersia virginica	-3	FACW	N GRASS	WHITE GRASS
LOBSIP	4	Lobelia siphilitica	-4	FACW+	N FORB	BLUE CARDINAL-FLOWER
LYSNUM	*	LYSIMACHIA NUMMULARIA	-4	FACW+	A FORB	MONEYWORT
PEDCAN	7	Pedicularis canadensis	2	FACU+	N FORB	LOUSEWORT
PILFON	6	Pilea fontana	-3	FACW	N FORB	CLEARWEED
RANREC	5	Ranunculus recurvatus	-3	FACW	N FORB	HOOKED BUTTERCUP
RANSES	4	Ranunculus septentrionalis	-4	FACW+	N FORB	SWAMP BUTTERCUP
RIBAME	5	Ribes americanum	-3	FACW	N SHRUB	WILD BLACK CURRENT
SAGLAT	4	Sagittaria latifolia	-5	OBL	N FORB	ARROWHEAD
SALDIS	4	Salix discolor	-3	FACW	N SHRUB	PUSSY WILLOW
SALSEC	8	Salix sericea	-5	OBL	N SHRUB	SILKY WILLOW
SAMCAN	2	Sambucus canadensis	4	FACU-	N SHRUB	COMMON ELDER
SCIATR	4	Scirpus atrovirens	-5	OBL	N SEDGE	DARK GREEN RUSH
SOLDUL	*	SOLANUM DULCAMARA	0	FAC	A VINE	FALSE BITTERSWEET
SOLPAT	9	Solidago patula	-5	OBL	N FORB	ROUGH-LEAF GOLDENROD
SYMFOE	8	Symplocarpus foetidus	-5	OBL	N FORB	SKUNK CABBAGE
VERAME	10	Veronica americana	-5	OBL	N FORB	AMERICAN BROOKLIME
VIBOPU	*	VIBURNUM OPULUS	0	FAC	A SHRUB	EUROPEAN HIGH-BUSH CRANBERR

APPENDIX 4

SITE: seep/fen
COUNTY: Kendall
DATE: 24 September 1993, 18 & 19 May 1994
BY: John Taft
FILE: kendfen

FLORISTIC QUALITY DATA		NATIVE		ADVENTIVE	
37	NATIVE SPECIES	1 Tree	2.5%	0 Tree	0.0%
40	Total Species	3 Shrub	7.5%	1 Shrub	2.5%
5.73	NATIVE MEAN	0 Vine	0.0%	0 Vine	0.0%
5.30	W/Adventives	18 Forb	45.0%	1 Forb	2.5%
34.85	NATIVE INDEX	3 Grass	7.5%	1 Grass	2.5%
33.52	W/Adventives	10 Sedge	25.0%	0 Sedge	0.0%
-4.1	NATIVE WETNESS	2 Fern	5.0%	0 Fern	0.0%
-3.7	W/Adventives				
AVG: FAC. WETLAND (+)					

ACRONYM	CC	SCIENTIFIC NAME	CW	WETNESS	PHYSIOG	COMMON NAME
ANGATR	6	Angelica atropurpurea	-5	OBL	N FORB	ANGELICA
ASTPUN	8	Aster puniceus	-5	OBL	N FORB	SWAMP ASTER
CALTPA	7	Caltha palustris	-5	OBL	N FORB	COWSLIP
CARBUL	5	Cardamine bulbosa	-5	OBL	N FORB	BULB BITTERCRESS
CXCOMO	5	Carex comosa	-5	OBL	N SEDGE	BRISTLY SEDGE
CXHYST	6	Carex hystricina	-5	OBL	N SEDGE	BOTTLEBRUSH SEDGE
CXINTE	10	Carex interior	-5	OBL	N SEDGE	INLAND SEDGE
CXLAEG	7	Carex laevivaginata	-5	OBL	N SEDGE	SEDGE
CXLEPT	10	Carex leptalea	-5	OBL	N SEDGE	BRISTLE STALKED SEDGE
CXSART	5	Carex sartwellii	-5	OBL	N SEDGE	SARTWELL SEDGE
CXSTRI	5	Carex stricta	-5	OBL	N SEDGE	TUSSOCK SEDGE
CXSUBE	7	Carex suberecta	-5	OBL	N SEDGE	SEDGE
CXTRIC	6	Carex trichocarpa	-5	OBL	N SEDGE	SEDGE
CHEGLB	7	Chelone glabra	-5	OBL	N FORB	WHITE TURTLEHEAD
CIRMUT	9	Cirsium muticum	-5	OBL	N FORB	FEN THISTLE
CORSTS	3	Cornus stolonifera	-3	FACW	N SHRUB	RED OSIER DOGWOOD
EPICIL	6	Epilobium ciliatum	3	FACU	N FORB	NORTHERN WILLOW HERB
EQUARV	0	Equisetum arvense	0	FAC	N FERN	COMMON HORSETAIL
EUPPER	4	Eupatorium perfoliatum	-4	FACW+	N FORB	COMMON BONESET
FRANIG	8	Fraxinus nigra	-4	FACW+	N TREE	BLACK ASH
GALTIN	6	Galium tinctorium	-5	OBL	N FORB	STIFF BEDSTRAW
GLYSTR	4	Glyceria striata	-5	OBL	N GRASS	FOWL MANNA GRASS
IRISHR	5	Iris shrevei	-5	OBL	N FORB	SOUTHERN BLUE FLAG
LEEORY	3	Leersia oryzoides	-5	OBL	N GRASS	RICE CUTGRASS
LYCAME	3	Lycopus americanus	-5	OBL	N FORB	COMMON WATER HOREHOUND
MUHMEX	4	Muhlenbergia mexicana	-3	FACW	N GRASS	LEAFY SATIN GRASS
PEDCAN	7	Pedicularis canadensis	2	FACU+	N FORB	LOUSEWORT
POAPRA	*	POA PRATENSIS	1	FAC-	A GRASS	KENTUCKY BLUEGRASS
PYCVIR	5	Pycnanthemum virginianum	-4	FACW+	N FORB	COMMON MOUNTAIN MINT
RHAFRA	*	RHAMNUS FRANGULA	-1	FAC+	A SHRUB	GLOSSY BUCKTHORN
RIBAME	5	Ribes americanum	-3	FACW	N SHRUB	WILD BLACK CURRENT
SALDIS	4	Salix discolor	-3	FACW	N SHRUB	PUSSY WILLOW
SCITAB	4	Scirpus tabernaemontanii	-5	OBL	N SEDGE	GREAT BULRUSH
SELAPO	7	Selaginella apoda	-5	OBL	N FERN	MARSH CLUB MOSS
SILPER	4	Silphium perfoliatum	-2	FACW-	N FORB	CUP PLANT
SOLPAT	9	Solidago patula	-5	OBL	N FORB	ROUGH-LEAF GOLDENROD
SYMFOE	8	Symplocarpus foetidus	-5	OBL	N FORB	SKUNK CABBAGE
TAROFF	*	TARAXACUM OFFICINALE	3	FACU	A FORB	COMMON DANDELION
TYPLAT	1	Typha latifolia	-5	OBL	N FORB	CATTAIL
VIOOBL	9	Viola obliqua	-5	OBL	N FORB	MARSH BLUE VIOLET

APPENDIX 5

SITE: Kendall 860-94
COUNTY: Kendall
DATE: 24 September 1993, 18-19 May 1994
BY: John Taft
FILE: Kendall1

FLORISTIC QUALITY DATA		NATIVE		ADVENTIVE	
88	NATIVE SPECIES	13 Tree	13.8%	0 Tree	0.0%
94	Total Species	8 Shrub	8.5%	3 Shrub	3.2%
4.67	NATIVE MEAN	6 Vine	6.4%	1 Vine	1.1%
4.37	W/Adventives	45 Forb	47.9%	2 Forb	2.1%
43.81	NATIVE INDEX	4 Grass	4.3%	0 Grass	0.0%
42.39	W/Adventives	10 Sedge	10.6%	0 Sedge	0.0%
-0.5	NATIVE WETNESS	2 Fern	2.1%	0 Fern	0.0%
-0.5	W/Adventives				
AVG:	FACULTATIVE (+)				

ACRONYM	CC	SCIENTIFIC NAME	CW	WETNESS	PHYSIOG	COMMON NAME
ACENEG	1	Acer negundo	-2	FACW-	N TREE	ASH-LEAVED MAPLE
ACESAI	1	Acer saccharinum	-3	FACW	N TREE	RIVER MAPLE
ACTPAC	7	Actaea pachypoda	5	UPL	N FORB	DOLL'S-EYES
ACTRUB	9	Actaea rubra	5	UPL	N FORB	RED BANEBERRY
AGRGRY	2	Agrimonia gryposepala	2	FACU+	N FORB	TALL AGRIMONY
ALLPET	*	ALLIARIA PETIOLATA	0	FAC	A FORB	GARLIC MUSTARD
AMPBRC	4	Amphicarpa bracteata comosa	0	FAC	N VINE	HOG PEANUT
ANEQUI	8	Anemone quinquefolia	0	FAC	N FORB	WOOD ANEMONE
ANGATR	6	Angelica atropurpurea	-5	OBL	N FORB	ANGELICA
AQUCAN	6	Aquilegia canadensis	1	FAC-	N FORB	COLUMBINE
ARALAE	4	Arabis laevigata	5	UPL	N FORB	SMOOTH ROCK CRESS
ASACAN	5	Asarum canadense	5	UPL	N FORB	CANADA WILD GINGER
ASCINC	4	Asclepias incarnata	-5	OBL	N FORB	SWAMP MILKWEED
ASITRI	4	Asimina triloba	0	FAC	N TREE	BANANA TREE
ASTLAT	2	Aster lateriflorus	-2	FACW-	N FORB	SIDE-FLOWERED ASTER
ASTPUN	8	Aster puniceus	-5	OBL	N FORB	SWAMP ASTER
BERTHU	*	BERBERIS THUNBERGII	4	FACU-	A SHRUB	JAPANESE BARBERRY
BOTVIR	4	Botrychium virginianum	3	FACU	N FERN	RATTLESNAKE FERN
BROPUR	7	Bromus purgans	-2	FACW-	N GRASS	BROME GRASS
CALTPA	7	Caltha palustris	-5	OBL	N FORB	COWSLIP
CAMAME	3	Campanula americana	0	FAC	N FORB	AMERICAN BELLFLOWER
CARBUL	5	Cardamine bulbosa	-5	OBL	N FORB	BULB BITTERCRESS
CXGRNG	3	Carex granularis	-4	FACW+	N SEDGE	MEADOW SEDGE
CXJAME	4	Carex jamesii	5	UPL	N SEDGE	GRASS SEDGE
CXLAEG	7	Carex laevivaginata	-5	OBL	N SEDGE	SEDGE
CXLEPT	10	Carex leptalea	-5	OBL	N SEDGE	BRISTLE STALKED SEDGE
CXLURI	7	Carex lurida	-5	OBL	N SEDGE	SEDGE
CXOLIC	6	Carex oligocarpa	5	UPL	N SEDGE	SEDGE
CXPENP	5	Carex pensylvanica	5	UPL	N SEDGE	PENNSYLVANIA SEDGE
CXSTIP	2	Carex stipata	-5	OBL	N SEDGE	PRICKLY SEDGE
CXSTRI	5	Carex stricta	-5	OBL	N SEDGE	TUSSOCK SEDGE
CHEGLB	7	Chelone glabra	-5	OBL	N FORB	WHITE TURTLEHEAD
CICMAC	4	Cicuta maculata	-5	OBL	N FORB	WATER HEMLOCK
CINARU	5	Cinna arundinacea	-3	FACW	N GRASS	STOUTWOOD REED
CLEVIR	3	Clematis virginiana	0	FAC	N VINE	VIRGIN'S BOWER
CORALT	6	Cornus alternifolia	5	UPL	N TREE	ALTERNATE-LEAVED DOGWOOD
CUSGLO	6	Cuscuta glomerata	0	FAC	N VINE	DODDER
DENLAC	4	Dentaria laciniata	5	UPL	N FORB	PEPPER-ROOT
ECHLOB	4	Echinocystis lobata	-2	FACW-	N VINE	WILD BALSAM-APPLE
EQUARV	0	Equisetum arvense	0	FAC	N FERN	COMMON HORSETAIL
ERIPHI	3	Erigeron philadelphicus	-3	FACW	N FORB	MARSH FLEABANE
EUPMAC	5	Eupatorium maculatum	-5	OBL	N FORB	SPOTTED JOE PYE WEED
EUPPER	4	Eupatorium perfoliatum	-4	FACW+	N FORB	COMMON BONESET
FRAAMC	4	Fraxinus americana	3	FACU	N TREE	WHITE ASH
FRANIG	8	Fraxinus nigra	-4	FACW+	N TREE	BLACK ASH
GALCIR	4	Galium circaezans	4	FACU-	N FORB	WILD LICORICE
GLYSTR	4	Glyceria striata	-5	OBL	N GRASS	FOWL MANNA GRASS
HELAUT	3	Helenium autumnale	-4	FACW+	N FORB	AUTUMN SNEEZEWEED
IMPCAP	2	Impatiens capensis	-3	FACW	N FORB	JEWELWEED

JUGNIG	4	Juglans nigra	3	FACU	N TREE	BLACK WALNUT
JUNVIR	1	Juniperus virginiana	3	FACU	N TREE	EASTERN RED CEDAR
LAPCAN	2	Laportea canadensis	-3	FACW	N FORB	CANADA WOOD NETTLE
LEEVIR	4	Leersia virginica	-3	FACW	N GRASS	WHITE GRASS
LILMIC	6	Lilium michiganense	-1	FAC+	N FORB	MICHIGAN LILY
LOBSIP	4	Lobelia siphilitica	-4	FACW+	N FORB	BLUE CARDINAL-FLOWER
LONMAA	*	LONICERA MAACKII	5	UPL	A SHRUB	AMUR HONEYSUCKLE
LONPRO	5	Lonicera prolifera	5	UPL	N SHRUB	GRAPE HONEYSUCKLE
LYSNUM	*	LYSIMACHIA NUMMULARIA	-4	FACW+	A FORB	MONEYWORT
PARQUI	2	Parthenocissus quinquefolia	1	FAC-	N VINE	VIRGINIA CREEPER
PEDCAN	7	Pedicularis canadensis	2	FACU+	N FORB	LOUSEWORT
PILFON	6	Pilea fontana	-3	FACW	N FORB	CLEARWEED
POLCAN	5	Polymnia canadensis	5	UPL	N FORB	LEAFCUP
PRUVIR	3	Prunus virginiana	1	FAC-	N SHRUB	COMMON CHOKECHERRY
PTETRT	4	Ptelea trifoliata	2	FACU+	N TREE	WAFER ASH
QUEMAC	5	Quercus macrocarpa	1	FAC-	N TREE	BURR OAK
QUEPRA	5	Quercus prinoides acuminata	4	FACU-	N TREE	CHINKAPIN OAK
RANREC	5	Ranunculus recurvatus	-3	FACW	N FORB	HOOKED BUTTERCUP
RANSES	4	Ranunculus septentrionalis	-4	FACW+	N FORB	SWAMP BUTTERCUP
RIBAME	5	Ribes americanum	-3	FACW	N SHRUB	WILD BLACK CURRENT
RIBMIS	2	Ribes missouriense	5	UPL	N SHRUB	MISSOURI GOOSEBERRY
RUDLAC	3	Rudbeckia laciniata	-4	FACW+	N FORB	CUTLEAF CONEFLOWER
SAGLAT	4	Sagittaria latifolia	-5	OBL	N FORB	ARROWHEAD
SALDIS	4	Salix discolor	-3	FACW	N SHRUB	PUSSY WILLOW
SALSEC	8	Salix x subsericea	-5	OBL	N SHRUB	SILKY WILLOW
SAMCAN	2	Sambucus canadensis	4	FACU-	N SHRUB	COMMON ELDER
SANTRI	8	Sanicula trifoliata	5	UPL	N FORB	LARGE-FRUITED BLACK SNAKERO
SCIATR	4	Scirpus atrovirens	-5	OBL	N SEDGE	DARK GREEN RUSH
SMIRAC	4	Smilacina racemosa	3	FACU	N FORB	FALSE SOLOMON SEAL
SMISTE	5	Smilacina stellata	1	FAC-	N FORB	STARRY FALSE SOLOMON SEAL
SOLDUL	*	SOLANUM DULCAMARA	0	FAC	A VINE	FALSE BITTERSWEET
SOLPAT	9	Solidago patula	-5	OBL	N FORB	ROUGH-LEAF GOLDENROD
SYMFOE	8	Symplocarpus foetidus	-5	OBL	N FORB	SKUNK CABBAGE
THADAD	5	Thalictrum dasycarpum	-2	FACW-	N FORB	PURPLE MEADOW RUE
THADIO	5	Thalictrum dioicum	2	FACU+	N FORB	EARLY MEADOW RUE
THATRT	6	Thaspium trifoliatum	5	UPL	N FORB	MEADOW PARSNIP
TILAME	5	Tilia americana	3	FACU	N TREE	AMERICAN LINDEN
TOXRAD	1	Toxicodendron radicans	3	FACU	N VINE	POISON IVY
TRIREC	5	Trillium recurvatum	4	FACU-	N FORB	RED TRILLIUM
ULMRUB	3	Ulmus rubra	0	FAC	N TREE	SLIPPERY ELM
VERALT	4	Verbesina alternifolia	-3	FACW	N FORB	WING STEM
VERAME	10	Veronica americana	-5	OBL	N FORB	AMERICAN BROOKLIME
VIBOPU	*	VIBURNUM OPULUS	0	FAC	A SHRUB	EUROPEAN HIGH-BUSH CRANBERR
VIBPRU	4	Viburnum prunifolium	3	FACU	N SHRUB	BLACK HAW
VIOSOR	3	Viola sororia	1	FAC-	N FORB	WOOLLY BLUE VIOLET